Attachment 5

The Bay Institute of San Francisco

*** MEMORANDUM ***

April 21, 1997

TO: B-DAC Ecosystem Restoration Workgroup

FR: Gary Bobker

RE: Ecosystem assurances and adaptive management

In preparation for our next workgroup meeting, I thought it might be useful to reiterate and expand on the main points I made at the March 26 meeting concerning ecosystem assurances, in response to Mary Scoonover's presentation, and points made at other times.

There seems to be universal agreement that long-term ecosystem restoration must be based on a sound adaptive management regime. The challenge is: how do we adaptively manage a dynamic ecosystem in the face of continuing stresses and yet provide assurances both that ecological objectives will be achieved and that reliability for reasonable human uses of the estuary will be attained?

In my view, there are at least six key components of an adaptive management regime:

- clear, unambiguous standards for attainment of ecological health;
- complete equity between the environment and other interests;
- centralized planning and oversight;
- integrity of the scientific review process;
- decreased reliance on outside or perpetual sources of funding; and,
- means of insulating human uses of the estuary from adaptive management changes which do not indemnify users against any changes in future obligations.

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1. Ecological health standards

Adaptive management implies that the efficacy of tools ("targets" and "actions") for achieving ecosystem management goals is sometimes uncertain, and that in any case the object of management (the ecosystem) is dynamic and subject to change. Adaptive management therefore assumes that the means to the end (or at least some of the means) are conjectural and evolutionary, and that targets and actions will be refined over time. In order to assure that adaptive management will be successful in selecting, evaluating, and refining those means, however, it is necessary for the ecosystem restoration program to have clear and unambiguous ends. For CALFED, those ends are standards (performance measures) of ecological health: desired ecosystem services, habitat quality, biological diversity, species abundances and other characteristics of the Bay-Delta environment, expressed as quantitative values or ranges of values in time and space and measured by indicators of ecological health. Attainment of ecological health standards would represent as close a return to the ecological integrity, biological diversity and resilience of the historic natural ecosystem as is possible. Ecosystem assurances are founded on the adoption of ecological health standards by CALFED and their formal incorporation into the appropriate planning, regulatory, legislative and other frameworks. Unlike targets and actions, it should be extremely difficult to change ecological health standards (see #4 below).

2. Environmental equity

A number of private and public entities exist whose primary purpose is to support human uses of the estuary and which are empowered with sufficient funds and institutional authorities to further that purpose. On the other hand, public agencies with fish and wildlife or environmental quality responsibilities typically must balance between multiple objectives and are part of government hierarchies with competing non-environmental interests, while private interests whose primary purpose is to protect ecosystem functions of the estuary usually lack funds or institutional authorities. Equity for the environment of the Bay-Delta is not achieved under this configuration.

Three approaches to providing environmental equity follow:

a. Creation of a Bay-Delta environmental "self-interest" to serve as a countervailing interest to entities that primarily support human uses of the estuary. For example, a number of parties have proposed creating an environmental trustee (aka Bay-Delta Restoration Trust, Environmental Water Authority, etc.) whose sole purpose is protection of ecosystem function

of the estuary and which is fully empowered with long-term funding (sufficient to fully implement the restoration program) and institutional authorities. In addition to implementing restoration activities, this entity would logically also provide centralized planning, oversight and scientific review services for the long-term restoration program (see #3 and 4 below). In this version, the decision-making body for the environmental trustee would consist solely of environmental, conservation, and resource management representatives.

b. Creation of an environmental trustee, with a "balanced" decision-making body consisting of environmental interests, extractive users, and governmental representatives, provided that such a "balanced" approach was also incorporated into decision-making processes for extractive uses (water supply, land use, etc.). The analogy here is with the Ecosystem Roundtable and the Ops Group, in which stakeholders advise the state and federal government on restoration funding and project operations; currently, the stakeholder role is more formalized in the Roundtable than in the Ops Group. It would not be equitable to turn a stakeholder ecosystem advisory process into a stakeholder ecosystem decision-making process without doing the same for stakeholder involvement in extractive use decisions.

c. Integration of interests in environmental protection and human use of the estuary into a single entity. This "superorganism" could oversee water project operations, restoration activities, conservation, groundwater management, flood control efforts, etc. Such an approach would probably require major changes to the institutional structure of current federal, state and local agencies.

3. Centralized planning and oversight

It may be appropriate to implement the many components of the CALFED ecosystem restoration program using a variety of approaches, including implementation by an environmental trustee; CALFED member agencies; other state, federal and local public agencies; local conservancies; and private interests. A pluralistic implementation strategy, however, does not obviate the need for centralized planning and oversight by an environmental trustee, "superorganism" or other entity in order to assure, among other things, consistency of localized restoration activities with the master plan; assessment of progress toward achieving ecosystem performance objectives; standardization of research and monitoring data protocols; and consolidated reporting to state and federal lawmakers, agencies with endangered species or environmental quality responsibilities, and the public.

4. Integrity of scientific review

Scientific review and revision of the long-term ecosystem restoration program should be as insulated from political considerations as possible. For instance, primary scientific review responsibilities could rest with independent, non-affiliated scientists housed at an environmental trustee or other restoration entity and paid through a special dedicated fund. Scientific staff (aka Ecological Health Board) would be nationally recognized experts in conservation biology, restoration ecology, water quality, etc, with no direct involvement in Bay-Delta management activities, who would work with and be advised by agency, stakeholder and other technical experts with knowledge of the estuary. Responsibilities of the scientific staff would include:

a. annual review of progress toward attainment of ecological health standards;

b. annual review of research and monitoring activities, interpretation of results and recommendations for modifications to future r+m efforts;

c. annual review of efficacy of restoration implementation efforts, and recommendations to the trustee, CALFED and/or others for modifications to the implementation strategy;

d. oversight of long-term review of ecological health standards (for instance, convening a national task force on Bay-Delta ecological health in conjunction with NAS or AAAS every ten years to review the adequacy of the standards and make recommendations based on advances in understanding of ecological health).

5. Decreased reliance on outside or perpetual funding

The CALFED ecosystem restoration program will rely heavily on market mechanisms (i.e., purchases of water, water rights, and land) for achieving additional environmental protections. A market-based program is most assured of success if it can decrease its reliance on the need for outside sources of funding (approved as part of the annual legislative or administrative budgetary decision-making cycle) which are highly subject to political influence and diversion to other programs. Thus, direct allocation of bond monies, special taxes, user fees, etc., to an environmental trustee or other entity would provide increased assurance that ecosystem restoration will be fully funded over the long term.

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Similarly, a market-based program is more likely to succeed if its efforts result in permanent acquisition and control over water or land resources. Purchases of water through the market on an annual basis, land use leases and other options will play an important role in restoration activities, but such approaches do not guarantee the long-term availability of water for instream flow augmentation or prevent ultimate conversion of land to purposes inconsistent with ecosystem restoration. In addition, such approaches require that funding for annual or temporary water and land acquisitions be assigned in perpetuity. In contrast, direct acquisition of rights to water and land provide a higher level of assurance that long-term restoration will occur by securing availability of these resources in perpetuity and lessening the reliance on the continued existence of funding sources to make purchases fifty, one hundred or two hundred years in the future. Institutional and legal barriers to permanent water and land acquisitions should be removed as part of ecosystem assurances.

6. Insulation without indemnification

A long-term solution should assure that adaptive management serves as an insulator of human uses of the estuary from short-term implementation failures or newly detected emerging environmental problems which could affect reliable use. In other words, a program for long-term ecosystem restoration which is fully funded, institutionally empowered and capable of making adaptive decisions to achieve ecological health standards should provide an enormous cushion against environmental change and consequent disruption of human uses. If the funding and institutional resources of the program are not adequate to apply the lessons learned from restoration mistakes and to deal with the scale of any newly detected or emerging problems, such disruptions are highly likely.

Paradoxically, extractive users of estuary resources support adaptive management of a dynamic, changing environment but want "no surprises" when it comes to long-term reliability of water supply, etc. The complexity of the estuary ecosystem, the degree to which it has been altered, the extent of continuing human use of the estuary's resources, the ongoing responsibilities of public agencies that extract resources from the estuary, and the 30 - 100+ year horizon for long-term ecosystem restoration, all argue against providing assurances that extractive users will be indemnified against any future adverse impacts, either as a result of newly detected impacts of their extractions or as a response to major new threats to the ecosystem. For this reason, a "no surprises" assurance based on compliance with a habitat conservation plan is unlikely to provide the necessary ecosystem assurance (unless, of course, the HCP includes acquisition of 3 million acre-feet of environmental water and restoration of one-third to one-half of predisturbance habitats!). Rather, an approach which

provides maximum insulation against disruption but which includes a safety net for reconsultation and reevaluation of future obligations is more desirable. Such an approach would only be workable if the conditions for invoking reconsultation and reevaluation (for instance, nonattainment of ecological health standards over a set period) and the decision-making process for reassessing future obligations were both rigorously defined.